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January 7, 2000

Assistant Commissioner for Patents
Washington, D.C. 20231

Attention: Box PCT - DESIGNATED/ELECTED OFFICE (DO/EO/US)

FORM PTO-1390 (REV 5-93) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY'S DOCKET NUMBER: 32143-156903
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371		U.S. APPLICATION NO. (If known, see 37 CFR 1.5)
INTERNATIONAL APPLICATION NO.: PCT/FR98/01437	INTERNATIONAL FILING DATE: July 6, 1998	PRIORITY DATES CLAIMED: July 7, 1997
TITLE OF INVENTION: - see attached pages -		
APPLICANT(S) FOR DO/EO/US: - see attached pages -		

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. X This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.
3. X This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).

– See attached pages for additional data –

#176959

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Branch

In re Patent Application of

Applicant : Pierre PICCALUGA

International Appln. No. : PCT/FR98/01437

Attorney Dkt. No. 32143-156903

Filed : Concurrently herewith

For : METHOD AND DEVICE FOR FORMATTING A DIGITAL AUDIO SIGNAL TO BE USED FOR SOUND REPRODUCTION

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to initial examination of the application, please amend the above-identified application as follows:

IN THE CLAIMS:

Please amend claims 2, 3, 5 and 6 as follows:

Claim 2, line 1, change "characterised by" to --wherein--.

Claim 3, line 1, change "(1) or (2)" to --1--.

Claim 5, line 1, change "(4)" to --4--; and change "characterised in that" to --wherein--.

Claim 6, line 1, change "claims (4) or (5)" to --claim 4--; and change "characterised by" to --wherein--.

REMARKS

Claims 1-6 are pending in this application. By this Amendment, claims 2, 3, 5 and 6 are amended to either delete multiple dependency and/or further clarify the invention and better correspond the claims to U.S. practice. No new matter is contained in the amendments.

Respectfully submitted,

26031

John W. Schneller
Registration No. 26,031

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Post Office Box 34385
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(202) 962-4800

Date: January 7, 2000

JWS/ts

#176950

2/PRTS

METHOD AND DEVICE FOR FORMATTING A DIGITAL AUDIO SIGNAL TO BE USED FOR SOUND REPRODUCTION

The principle for feeding electro-acoustic transducers by analog type amplifiers is most commonly used. In fact, the analog movement of the membrane follows sine waves which are curves sampled on recording. The condition for using the electric audio signal is the signal picked up by the micro-computer(s) or derived directly from digital samplers, said signal being smoothed for analog usage. The original digital sound signal used has an intensity and a frequency of 44,100 samples per second according to a well-known model (Fig. 1). The method is the original signal copied and reproduced to obtain a new digital signal for electrically controlling electro-acoustic transducers.

In fact, the pulse response of the electro-acoustic transducers does not conform to the signals emitted by the digital principle. A trailing effect can be observed on the pulses of the membranes which does do not stop when the pulse is finished. The mechanical pulse is extended by the effect of the weight of the membrane for strong pulses. The fine pulses are then masked in this particular condition. It becomes necessary to resolve this drawback by using the present method by imposing at least one additional item of information to control the mechanical effects of the runaway movements of the membranes.

The present method concerns an interface software containing a programmed special compensation control correction adapted for an electro-acoustic transducer.

Two possibilities have been retained to mitigate the mechanical runaway effects, either a multiplication of the digital audio signal with

smaller but in phase values, or phase inversion pulses. To achieve this, the method concerns using original reference digital sound signals which are copied and reproduced in several copies into a new disposition not modifying the time of the original. Control is precise in order to overcome the mechanical inertia of the membranes. The time parameter is a constant, also when the information doubles or triples the frequency of the signals double and triple proportionally to the multiplication of the reproduced copies. These copies of signals may have values of different intensities with respect to the original and with respect to one another. For example (Fig. 2), a time period is shown on the horizontal line where the values (EC) are present, the signals are copied and the time period does not change. The first copy reproduced has a scale ratio of 1/3 of the original and a second copy has a ratio of 1/1. It is clear that the multiple reproduction of the signals of the new sound signal corresponds to an adjustment of the frequencies of the doubled, tripled or quadrupled signals as many times as the original signal is multiplied. It is not echo which extends the note, but a method compensating the inertia of the membranes adapted to the dynamic stresses which by the weight dissociates the current voltage parameters of the instant. A smoothing of the newly formatted signal is provided to obtain an analog signal.

This digital or analog audio signal can be directly applied to the terminals of at least one electro-acoustic transducer.

This multiple reproduction of the original recorded signal may firstly have its intensity value different and secondly a phase shift, a sliding able to go up to its total inverse phase value with respect to the original signal. This method is characterised by the multiple reproduction of the originals (Fig. 3), known as the "original signal" with a given time (TP), into a new formatted signal 4 times the original frequency whose two copies are in inverse phase and with ½ intensity value. These phase inversion signals smooth-plane the membrane whose inertia would push it away too far and it would be late for the next pulse which creates current voltage dissociation.

The method can copy the original message and reproduce it according to all the variants of the combinations described identically for each original signal per order cyclic sequence reproduced in the intensity and phase scale ratio T1, T2, T3, T4 (Fig. 4).

The method has a device for formatting the audio signal for an electro-acoustic transducer, characterised by an original digital signal referential recorded on a medium or directly copied by reproduction of the original according to the method determining an interface software between an original digital signal and a newly formatted digital signal for an electric control of the best possible adapted mechanical movements. The new signals are at least two copies of the original signal. The copies of the signals may be in-phase or total in-phase inversion signals with respect to the original. The intensities of each signal can be a fraction of the intensity value of the original.

A device can be embodied by an expert in this field as an example (Fig. 4) in a sound reproduction chain having a radio receiver, a laser disk reader (CD) and a formatting system according to the method integrated in a digital amplifier (AN) for feeding the acoustic speakers (E). The amplifier receives the digital message via the optical beam (FO) and decodes the digital audio signal via the decoder (D) which shall establish the original signal. This signal is transferred to four samplers (T1, T2, T3, T4) managed by a common clock. A micro-computer (HC) fitted with a relay for regular and cyclic scanning programmes the activities of the four samplers able to be adjusted with respect to the values of the decoder (D). Each sampler, by copying the reproduced original signal, uses two programming potentiometers, namely one to position the scale ratio of the intensities, and the other for the phase of the intensities between the phase synchronicity and the phase inversion sliding with respect to the original. In this case, the sampler (T1) is identically adjusted as the sampler of the decoder of the original signal.

The sampler (T2) is adjusted to the inverse phase value of (T1) with the same intensity value. The sampler (T3) is adjusted to 1/3rd of the intensity of T1 and 1/2 the intensity of (T1). The sampler (T4) is in phase with (T1) and ½ of (T1). The formatted signal (F) is amplified by the amplifier (A) whose power in adjusted by the potentiometer (V) determining the sensitivity of the decoder.

The digital audio signal formatting devices according to the present method need a frequency 4 times greater for the medium and high notes and 3 times greater for the low notes. The sound reproduction system (Fig. 5), made up of a micro-computer, a digital audio cassette

recorder/reader and a laser disk reader and possibly other items are connected to the power digital amplifier with four independent outputs having 2 low notes (B) and 2 satellites (S). The amplifier requires decoders (RA) which establish the original signal. An electronic clock in an electronic chip (HE) co-ordinates the regular and cyclic programmed order of action of four samplers which determine the profile of the new sound message. The channels respectively receive three samplers coupled for the low notes (EGD, EGG) all phase-adjusted in a ratio of 1/3rd on reduction of the first with respect to the second and 1/3rd of the second with respect to the third. The signal newly formatted by the computer (X) is amplified by the amplifier (AX) so as to feed the low note boxes. The samplers (ESG, ESD) with four levels feed the satellites by means of the amplifiers (AX). The frequencies (ESG, ESD) have four times the speed of (RA), whereas those of (EGG, EGD) have three times the speed of (RA). A smoothing modem is provided for analog reading, this device not being restrictive and merely an example. All the electronic means with a semiconductors active or passive component or all the forms of micro-computers and integrated circuits or future products in the field of connections and active electronics can be used to embody these devices.

The present method and device adapts the digital sound signal into a digital signal for controlling all the electro-dynamic transducers. This correction principle can be used in audio and audiovisual applications.

CLAIMS

1. Method for formatting a digital audio signal for controlling at least one electro-acoustic transducer from an original digital signal of an electric sound signal modified into a digital sound signal by copying the original signal at a higher frequency proportional to the copies whose reproduced copies have intensity values different from the original so as to control the mechanical runaway effects of electro-acoustic transducers.

2. Method according to claim 1, characterised by the phase inversion of the copies which have intensities possibly ranging up to the total phase inversion with respect to the original signal.

3. Method according to claim (1) or (2) where the newly-formatted digital signal is smoothed for use as an analog signal.

4. Device for formatting a digital control signal applied directly to the terminals of at least one electro-acoustic transducer from an original signal of a digital recorder or a digital sound medium into a new digital sound audio signal whose original signals are copied and reproduced at higher frequencies created by specific samplers for each of the copied signals, characterised in that the phase and intensity values of the new signals are adjustable by two distinct potentiometers and whose order of action of the samplers (T1, T2, T3, T4) is cyclic and regular and is ensured by an electronic clock (HE).

5. Device according to claim (4), characterised in that the frequency of the samplers is proportional to the reproduced number of copies, namely the doubled frequency if there are two copies and quadrupled if there are four copies of the original signal.

6. Device according to claims (4) or (5), characterised by the addition of a smoothing modem for an analog function.

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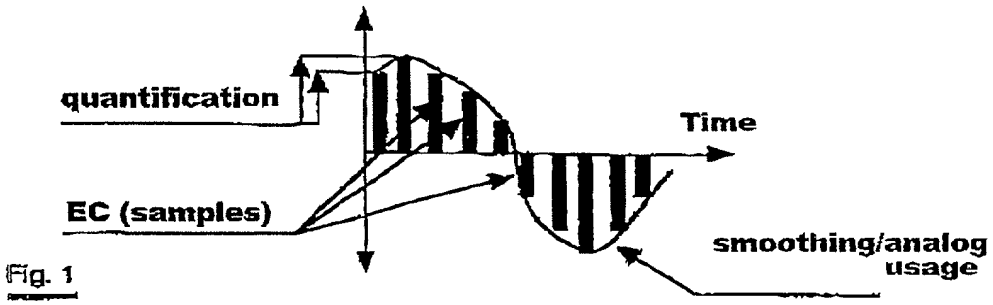

Fig. 1

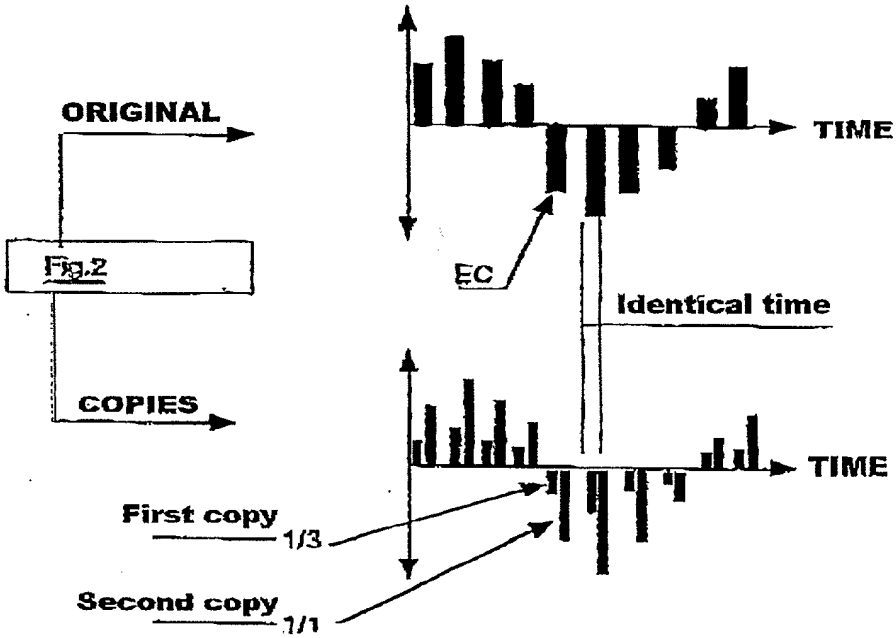

Fig.2

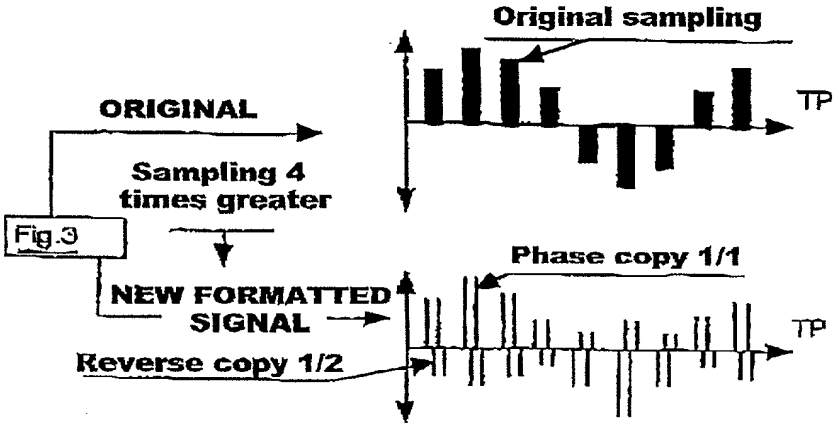

Fig.3

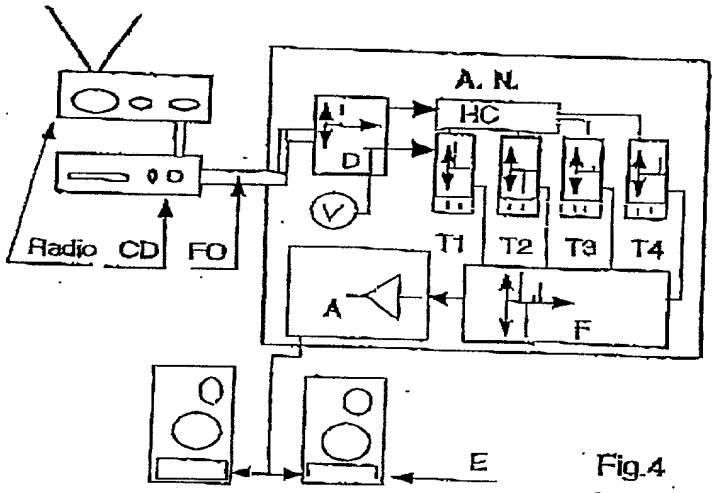

Fig.4

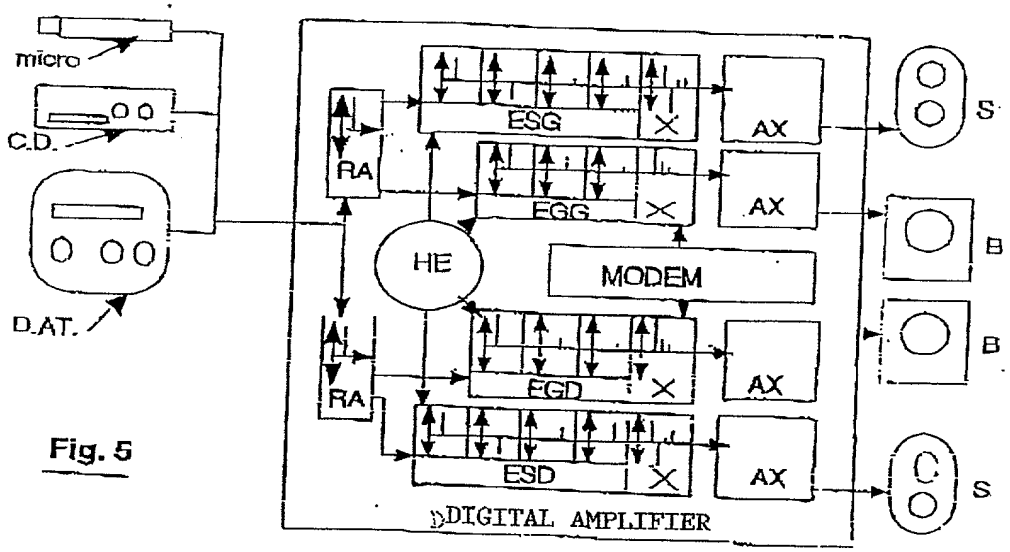

Fig. 5

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March 10, 2000

Attorney Docket No.: 32143-156903

Assistant Commissioner for Patents
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Re:	International Application No.	PCT/FR98/01437
	U.S. Serial No.	09/462355
	International Filing Date:	July 6, 1998
	Priority Claimed:	July 7, 1997
	Inventor:	Pierre PICCALUGA

Title: METHOD AND DEVICE FOR FORMATTING A DIGITAL AUDIO SIGNAL TO BE USED FOR SOUND REPRODUCTION

Sir:

In reply to the Notification of Missing Requirements dated February 29, 2000, submitted herewith are the following:

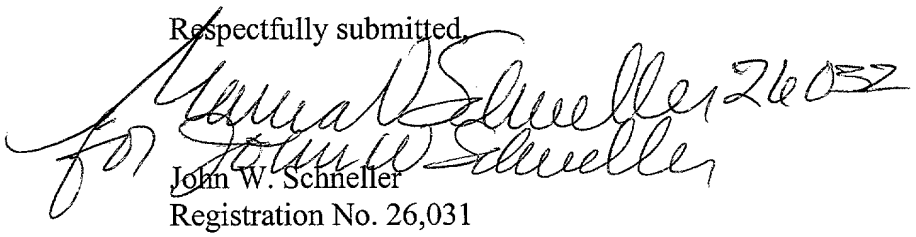
- A copy of the Notification of Missing Requirements;
- A Declaration/Power of Attorney; and
- A check in the amount of $65.00 for small entity fees for delayed declaration. Applicant submitted a Statement Claiming Small Entity Status Declaration in the U.S. Patent and Trademark Office on March 1, 2000.

The Examiner is respectfully requested to acknowledge that all of the requirements of 35 U.S.C. §371 have been met.

03/15/2000 UWALKER 00000001 09462355
01 FC:254 65.00 OP

Please charge any fee deficiency or credit any overpayment to Deposit Account No. 22-0261.

Respectfully submitted,



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#187397

Docket No.: 32143-156903

DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I declare that:

My residence, post office address, and citizenship are as stated below next to my name. I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter that is claimed and for which a patent is sought on the invention entitled

METHOD AND DEVICE FOR FORMATTING A DIGITAL AUDIO SIGNAL TO BE USED FOR SOUND REPRODUCTION

[ ] the inventor's declaration for said application being executed concurrently with the execution of this instrument; said application to be filed in the U.S. Patent and Trademark Office;

[ ] said application having been filed in the U.S. Patent and Trademark Office on _____ and given Application No. _____;

[X] said application having been filed under the Patent Cooperation Treaty on July 6, 1998 and given Application No. PCT/FR98/01437, the United States of America having been designated.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge that duty to disclose information of which I am aware and which is material to the examination of the patent application in accordance with 37 CFR §1.56.

I hereby claim foreign priority benefits under 35 U.S.C. §119(a)-(d) or §365(b) of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT International application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the space, any foreign application for patent or inventor's certificate, or of any PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)

Number	Country	Day/Month/Year Filed	Priority Claimed
97/08822	France	July 7, 1997	YES

I hereby claim the benefit under 35 U.S.C. §119(e) of any United States provisional application(s) listed below.

Application Serial Number	Filing Date

I hereby claim the benefit under 35 U.S.C. §120 of any United States application(s), or §365(c) of any PCT International application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States of PCT International application in the manner provided by the first paragraph of 35 U.S.C. §112, I acknowledge the duty to disclose information known to me which is material to the patentability as defined in 37 CFR §1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application.

Application Serial Number	Filing Date	Status (patented, pending, abandoned)

Docket No.: 32143-156903

(21)

Each undersigned applicant hereby appoints the following attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith: **George H. Spencer** (Registration No. 18,038), **Robert J. Frank** (Registration No. 19,112), **Norman N. Kunitz** (Registration No. 20,586), **Gabor J. Kelemen** (Registration No. 21,016), **John W. Schneller** (Registration No. 26,031), **Marina V. Schneller** (Registration No. 26,032), **Robert Kinberg** (Registration No. 26,924), **L. Allen Wood, Jr.** (Registration No. 28,134), **Ashley J. Wells** (Registration No. 29,847), **James R. Burdett** (Registration No. 31,594), **Michael A. Gollin** (Registration No. 31,957), **Catherine M. Voorhees** (Registration No. 33,074), **Gary L. Shaffer** (Registration No. 34,502), **Chellis Erika Neal** (Registration No. 36,877), **G. Abe Zachariah** (Registration No. 38,366), **Patricia R. Brown** (Registration No. 39,012), **Julie A. Petruzzelli** (Registration No. 40,769), , **Catherine A. Ferguson** (Registration No. 40,877), **Michael P. Leary** (Registration No. 41,144), **Michael A. Sartori** (Registration No. 41,289), **Zayd Alathari** (Registration No. 42,256) and **Fei-Fei Chao** (Registration No. 43,538).

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The undersigned hereby authorizes the U.S. attorneys named herein to accept and follow instructions from the undersigned's assignee, if any, and/or, if the undersigned is not a resident of the United States, the undersigned's domestic attorney, patent attorney or patent agent, as to any action to be taken in the Patent and Trademark Office regarding this application without direct communication between the U.S. attorneys and the undersigned. In the event of a change in the persons(s) from whom instructions may be taken, the U.S. attorneys named herein will be so notified by the undersigned.

I declare (or certify, verify, or state) under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

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Inventor's signature _____ Date 02.02.2000
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Citizenship: French
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